

## NOTES ON THE GENERA OF VESPERTILIONIDÆ.

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At the conclusion of a study of this family I venture to place on record my views respecting the position of the genera *Antrozous*, *Corynorhinus*, *Synotus*, *Noctulinia*, and *Kerivoula*.

*Antrozous*.—*Antrozous* is a composite genus. It is not specially related to *Corynorhinus* and *Plecotus*. In the incomplete tympanic bone, in the absence of the palatal plate to the premaxilla, in the markings on the fourth digital interspace, in the shape and relation of the ulna, in the possession of a tubercle on the palmar surface of the trapezium, in the details of the molars, in the arrangement of the nasal scrolls, and in the deflection of the cartilage of the fourth digit toward the thumb, *Antrozous* is in alliance with *Vespertilio*. It is distinguished therefrom by the absence of the accessory cartilage to the fifth digit. Affinity with *Corynorhinus* is suggested by the shape of the muzzle-glands. *Antrozous* resembles *Atalapha* in the shapes of the last molars as well as in the proportions of the hypocond, but in the presence of four incisors in the lower jaw,\* in the free lower lip, in the head not being in axis with the body, in the manal formula, in the disposition for the nostril to bear a vertical internarial ridge and the upper border of the muzzle a constant transverse outgrowth, in the presence of a hem of membrane on the pollical side of the second metacarpal bone, recalls the Phyllostomidæ.

*Corynorhinus*.—This genus is in close relation to *Euderma* and *Plecotus*, so the term Plecoti adopted by Dobson is a useful one to be employed in this restricted sense for the genera above named. I would exclude from the group *Antrozous* and *Synotus*. *Nyctophilis* and *Otonycteris* I have not studied. *Corynorhinus* differs from *Antrozous* in the greater development of the hypocone in the upper jaw and its equivalent in the lower jaw. The points of the cusps are more produced than in the genus last named. The thumb is semiflexed (thus denotive of free motion in the carpo-metacarpal joint), the callosity is rudimentary. The palmar aspects of the manal digits are well defined at the proximal ends, being thus without the radiated raised folds of the skin seen elsewhere in the family. The terminal cartilages of the digits

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\* In the restriction of the lower incisors to four in a family where the dominant number is six it is of interest to note that in *Nyctinomus brasiliensis* the third incisor on each side is rudimental or may be lost, thus reducing the number from six to four.

are axially disposed to their respective phalanges, a character not seen in *Antrozous* or in the Vespertilionidæ other than in the Plecoti. The third metacarpal bone is relatively short, a character often met with in the Phyllostomidæ. The trapezium is without a palmar tubercle, again a character of the family last named. The sphenoid foramen lies at the bottom of a deep recess. The interphalangeal joint of the fifth digit is freely movable. *Corynorhinus* thus shows characters which distinguish it from the vespertilionine group and relate it to the Phyllostomidæ.

*Synotus*.—*Synotus* exhibits the tubercle at the base of the trapezium; the terminal cartilage of the fourth digit is not axial, as in *Corynorhinus*, but is deflected toward the thumb. In like manner the first metacarpal bone is not freely movable at the carpometacarpal joint, as in *Antrozous* and the Vespertilionidæ generally. The interphalangeal joint of the fifth digit is semianchylosed. These characters indicate an increased strain on the wing membrane as compared with *Corynorhinus*, where the joint movements are freer, and places the genus in close alliance to *Adelonycteris*, *Vesperugo*, and *Vespertilio*, while removing it from the Plecoti.

*Noctulinia*.—This genus was established by J. E. Gray (Ann. and Mag. N. H., 1842, x, 255). Jerdon (Mammals of India, 1867) considers the genus valid, though zoologists generally have followed Keyserling and Blasius (Wiegmann Archiv, 1839, p. 317), who include the noctule bat in their genus *Vesperugo*. I propose to rehabilitate *Noctulinia*. It is quite distinct from *Vesperugo*, notwithstanding the similarity in the number of the teeth.\* A rudiment of a biceps muscle is present in

\* The following is quoted from Jerdon's "The Mammals of India," Roorkee, 8vo, 1867, p. 36:

Gen. *Noctulinia*, Gray.

Feet quite free from the membrane, which is attached to the ankle only; otherwise as in *Scotophilus*. Incisors,  $\frac{1}{4}$ ; molars,  $\frac{5-5}{5-5}$ ; by age,  $\frac{1-1}{1-1}$ ; with a very small false molar.

*Noctulinia noctula*.

*Vespertilio* apud Schreber.—*V. lasiopterus*, Schreber.—*V. altiroians*, White.—*V. labiata*, Hodgson.—Blyth, Cat. 89.

The Noctule Bat.

*Description*.—Ears remote, oval-triangular, or rounded, wide, extending nearly to the angle of the mouth; tragus short, broad, curved, ending in a broad rounded head; muzzle short, blunt, nude; lips somewhat tumid; fur dark, reddish brown, both above and below.

Length,  $4\frac{1}{2}$  to 5 inches, of which the tail is nearly 2; expanse, 11 to 15 inches; forearm,  $1\frac{1}{2}$ .

This fine bat has been sent from Nepal by Hodgson, who states that it is found in the central hills of Nepal. It is not uncommon in England, and its flight is lofty.

[The above extract includes the short statement of Gray regarding the manner of the attachment of the wing to the ankle and the indication of affinity of the genus to *Scotophilus*. It remains clear that my diagnosis as now given is the first offered of the genus *Noctulinia*. I have not studied *Vesperugo leisteri*, which is placed in the same group with the noctule bat. H. A.]

the thigh. The penis is provided with a bone. The muzzle is separated from the upper lip by a naked, smooth space. The lower border of the muzzle is not continuous with the upper border of the muzzle, but ends upon the sides of the face to form the lower border of a groove, the upper edge of which constitutes a distinct ridge at the side of the muzzle.

The lower lip presents a well-defined triangular mental plate; at the side the lip forms a thick rounded border. A deep groove lies below this border, which is limited in part by a low fold of skin almost joining the auricle as it ends near the angle of the mouth.

The proximal ulnar rudiment is ankylosed to the radius, and provided with a filamentous shaft. The pisiform bone is massive and lies parallel to the fifth metacarpal bone. Both the above characters are present in *Atalapha* and *Dasypterus*.\*

*Noctulinia* and *Atalapha* and its allies (I would place here *Miniopterus*) are thus seen to possess molossine affinities. The disposition for all the forms named to possess hairy wing membranes and the tragus to be of the same general character are also in evidence that they incline to form an alliance.

*Kerivoula*.—J. E. Gray showed good judgment in separating this genus from *Vespertilio*. The more the forms are studied the wider the interval will become which removes them from one another. In a study of *K. hardwickii* I found no trace of a phalax in the second digit. The phalanges of the third digit were of the same length; those of the fourth digit were very unequal, the second being the shorter, while in the fifth digit the second phalax was almost the length of the first. There was apparently no accessory cartilage at the side of the end of the fifth digit. There was no oblique tibial line on the wing membrane. I know of nothing similar to this in the family. Seven rugæ were seen on the hard palate. The ulna was ankylosed to the shaft at its middle, a character broadly contrasted to *Vespertilio* but but resembling that seen in the majority of the order. The first metacarpal bone was bound down its entire length to the second metacarpal and its callosity covered the entire palmar surface. A fleshy wart was found on the dorsal aspect of the forearm at the elbow.

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\* Proceedings of Am. Philosoph. Soc., XXIX, February 11, 1891.